

that applies force to the teeth. Dorlands further states a **fixed** appliance is synonymous to a **permanent** appliance. An **installed** orthodontic appliance is the same. **Braces** is also synonymous to **fixed** appliance. A **fixed (permanent, installed or permanent)** orthodontic appliance is comprised of **brackets** bonded (permanently attached) to teeth (or attached to a metal bands which are attached to the teeth), **arch wires** and **ties** (which attach the archwire to the bracket). The bracket attached to a tooth may be compared to a doorknob on a door. The doorknob (bracket or bracket with band) attaches to the door (tooth). Your hand (arch wire) then grips the doorknob (bracket) and applies the pressure to open the door (tooth). In the case of braces the arch wire applies the pressures to the brackets which in turn moves the teeth. A bracket is comprised of an **arch wire slot**, tie wings and base, which adheres to the tooth or band. The important concept is the arch wire slot receives the arch wire. The arch wire slot has a **maximum size of .022"**. The arch wire lies within the arch wire slot of the bracket; therefore, the **maximum arch wire diameter is .0215"**. The most common methods of holding the arch wire within the arch wire slot are wire ties or elastomeric ties which are attached to the bracket wings. The current invention fits adjacent to the arch wire, but does not fit within the bracket slot, which is the important feature of the invention allowing arch bar sizes which far exceed the maximum arch wire size. The arch bar need not fit the bracket slot. Fig. 7 is a good example of the bracket and arch wire wherein the front teeth show brackets with an arch wire 11 contained within the bracket slot. Notice above and below the arch wire, the bracket contains wings with notches on the tooth side of the wings. Further, note that in Fig. 7 the front brackets have no ties. Ties 13 are secured to these wings as shown in Fig. 6B. The tie travels over the buccal side of the arch wire securing the arch wire to the bracket.

The drawings in the present application depict teeth that are aligned. In other words, the positions of the teeth are in their final positions following orthodontic treatment wherein the alignment was achieved with a series of archwires, in the simplest terms, progressing from small diameter elastic wires to final large diameter thick wires. The initial small wires are straight until they are placed in the bracket slots and are ligated to the brackets wherein the wire loses its straight shape as it conforms to the alignment of the teeth.. The wire possesses elasticity; therefore, attempts to return to its original straight shape, which in the process aligns the teeth. Notice in Fig. 7 the archwire has the teeth aligned in a horizontal flat plane (the chewing surfaces), but looking at the teeth from the vertical the teeth are aligned in a curve. This curved alignment is called an arch form. If the original straight wire returned to its original straight form while attached to the brackets the arch form would be a straight line which would not be acceptable for tooth alignment; therefore, successively heavier specially bent arch wires are used as the teeth become more aligned. Fig. 7 shows the heaviest wire 11 within the bracket slots. The heaviest wire in its final form is usually bent with a flat occlusal plane and a curved arch form as

depicted in Fig. 7 where the teeth are perfectly aligned. Prior to this ideal wire form the heavy wire may be bent in different shapes in order to align the teeth more quickly. An example would a patient with an occlusal plane in the mandible, which is curved instead of flat. The arch wire would be formed with an occlusal plane with the opposite curve of the occlusal plane of the teeth which hastens the movement of the teeth to the flat occlusal plane. This concept is carried into the different bends of the accessory arch bar in the present application. I hope that the above description helps in the understanding of the components of braces and how they interrelate and function together.

In the claim changes in the last office action the word **piggybacked** was added. This was not new matter. Note in the Summary of the Invention, [0004], line 3: “The arch bar **piggybacks** the orthodontic arch wire.....” x “Piggybacking” was added to claims 1,7, 13, 19 and 25 to clarify the position of the accessory bar. The preamble in claims 1,7, 13, 19 and 25 describes the arch bar as an “accessory “ arch bar which is a structural limitation for the arch bar. Merriam-Webster dictionary defines **accessory** as a thing of secondary or subordinate importance: *adjunct*. An object or devise not essential in itself, but adding to the effectiveness of something else: *supplementary*. **Piggyback** is defined as to set up or cause to function in conjunction with something larger or more important; to function on the back of another. In the context of the present application, **accessory** and **piggyback** are **synonymous** terms. A claim preamble may have a structural limitation. A claim preamble has the importance that the claim as a whole suggests for it. Bell Communications research, Inc. V. Vitalink Communications Corp., 55 F. 3d 615, 620, 34 USPQ 2d 1816, 1820 (Fed. Cir. 1995). When the patentee uses the claim preamble to recite the structural limitations of his or her claimed invention, the Patent Office and Courts give effect to that usage. Corning Glass Works v Sumitomo Elec. U.S.P.S., Inc. 868 F 2d at 1257, 9 USPQ 2d. at 1966.

Not every rewording of the disclosure will be considered to introduce prohibitory new matter. As stated by the CCPA, “[a] subsequent clarification of or a change in an original disclosure does not necessarily make that original disclosure fatally defective. In re Nathan, 328t 2d 1005, 140 USPQ 601,603 (C.C. P.A. 1964. For example, mere rephrasing of a passage where the same meaning remains intact is permissible. In re Anderson, 471 F. rd 1237, 176 USPO 331, 336 (C.C.P.A. 1973) (word *containing* in claim changed to *carrying*). Similarly, the inclusion of a dictionary or technically recognized definition at the time of filing an application would not be considered new matter if these definitions are inserted in the application subsequent to filing.

The specification uses several adjectives to describe the orthodontic appliance which is fixed to the teeth as opposed to a removable orthodontic appliance:

Orthodontic appliance is used by itself: Field of Invention line 2; Summary of Invention lines 12 and 23; Description of Figures: Figs. 2, 3 and 6; Detailed Description of Invention: lines 7,10, 12, 15 and 21.

Fixed orthodontic appliance is used: Background of Invention line 3; Summary of Invention line 4.

Installed orthodontic is used : Detailed Description of Invention: line 2.

{ new} In claims 1, 7, 13, 19 and 25, Applicant claims an arch bar that is "attached to a fixed orthodontic appliance by piggybacking on the labial side of an installed orthodontic appliance." However, it is not clear how the arch bar can be fixed to said appliance by piggybacking on an installed orthodontic appliance since it is not disclosed whether the two appliances are distinct — i.e. how piggybacking the arch bar to an installed appliance can attach it to a separate fixed appliance.

Note the end of the above sentence: “to a **separate fixed appliance**”. Nowhere is this term (**fixed appliance** instead of **fixed orthodontic appliance**) used in Claims 1, 7, 13, 19 and 25. The specification with the drawings clearly describes what the orthodontic appliance is. Only a single orthodontic appliance is described and several adjectives are used to describe this single appliance.

Referring to the discussion above, a **fixed orthodontic appliance** and **installed orthodontic appliance** and **fixed orthodontic appliance** are synonymous terms, which are well known by an expert of ordinary skill in the art of orthodontics. The term **orthodontic appliance** also has the same meaning as it used in the specification.

It has been clearly disclosed in the present application that the accessory (or piggybacked) arch bar and the fixed orthodontic appliance (or its synonyms) are separate: Fig. 1 shows the accessory arch bar 1 separate and adjacent (buccal) to the arch wire 11 of the fixed appliance. The accessory arch bar is shown in Fig. 2A **outside (distinct) (piggybacked)** the orthodontic bracket 10 slot, with a single tie 13 (**how affixed**) attached to the bracket wing 10 (**how affixed**), the single tie containing both the arch bar and the arch wire attaching the arch bar to the fixed orthodontic appliance (**bracket and arch wire**). Figs. 5B and 5B show the arch bar 1 adjacent (**accessory or piggybacked**) to an arch wire 30 (**part of fixed appliance**) wherein the arch bar 1 and the arch wire 30 are **distinctly separate**. Figs. 6C and 6D show the accessory bar **distinctly and piggybacked, or accessory**, to the fixed orthodontic appliance

with ligature ties which attach to the bracket wings. Figs. 6C and 6D show the same arrangement. Figs 7-12 show the arch bar as being distinctly separate and Figs.10 and 12 show the arch bar being secured the fixed appliance with the ties.[0004] lines 3-9: ‘The arch bar piggybacks (or accessory to) the orthodontic arch wire and extends, just as the arch wire does, on the labial of the teeth. The arch bar may be attached to the orthodontic appliance using the same ligature ties used to tie the arch wire to the orthodontic brackets’. [0033]Lines 1-10: “As shown in FIG. 2, an orthodontic appliance is comprised of brackets 10 placed on the outer surface of the patient's teeth 12. An arch wire 11 is connected to the brackets 10 and held in place with ties 13, which can be metal wire or elastomeric eyelets. In FIG. 3 the accessory arch bar 1 is shown attached to the orthodontic appliance (**how fixed to braces**) using the same ties 13 which ligate the arch wire 11 to the orthodontic brackets 10. In another embodiment the arch bar 1 can be tied with separate ties 13 to the orthodontic appliance. The single tie 13 method is more efficient”. Claim 1. lines 11-15: Claim 7, lines 12-16; Claim 19 , lines 14-18; Claim 25, lines 14-18: “a tying means for attaching the accessory arch bar to an orthodontic appliance wherein a wire ligature or an elastomeric orthodontic module is used to attach the accessory arch bar to an orthodontic arch wire or directly to orthodontic brackets“(How fixed to braces).

{ New} Additionally, Examiner does not understand how the longitudinal body of the wire can become curved if placed on the installed orthodontic appliance as opposed to the fixed appliance.

As discussed above, installed orthodontic appliance and fixed orthodontic appliance are synonymous terms. Refer to Fig. 1. The arch bar 1 (accessory) in Fig. 1 is shown formed straight as it comes from the supplier. The wire has elasticity wherein it can be curved to a certain amount, such as the accessory arch bar 1 is pictured in Fig. 2, that when released it will return to its original straight shape as shown in Fig. 1. The accessory arch bar1 is piggybacked on the fixed orthodontic appliance (as described above) where it has a curved shape, but retains an elastic memory of a straight wire. The action of the arch bar attached to the fixed orthodontic appliance is to “ quickly widen the dental the molar arch width which is particularly useful in widening of the upper arch width in the correction of a posterior dental cross bite “. [0004] lines 14-16.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

I am responding with the following law concerning **102(b)** in mind:

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the....claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

MPEP 2131.01. Multiple references may be proper when extra-cited references are cited to:

- (A) Prove the primary reference contains an "enabled disclosure";
- (B) Explain the meaning of the term used in the primary reference; or
- (C) Show that the characteristic not disclosed in the reference is inherent.

3. **(Was claim 7} Claims 1, 3 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Wool (US 4,424,033). In re claims 1 and 3, Wool shows an arch bar comprising a metal wire with a longitudinal body having opposing longitudinal ends (Figure 1)**

Wool discloses an arch wire (fits within bracket slot), not an arch bar (fits outside bracket slot, accessory/piggybacked). Note in Wool in claims 1 and 2: “I claim an arch wire”. Wool in Brief Description of Drawings describes Fig. 1 as “..... a top plan view of a maxillary arch wire....”.

and a cross-sectional diameter (Figure 3);

Fig. 3 discloses a round cross-sectional diameter as the present invention discloses. Note Fig. 4 discloses a cross-sectional diameter which the present invention does not claim or disclose.

a longitudinal length similar to the length of an arch wire on a fixed orthodontic appliance (Figure 7);

Wool does not disclose a wire with a length similar to an arch wire; **he discloses an arch wire itself,**

which, of course, has the length of an arch wire.

a straight longitudinal body which becomes curved when placed on the orthodontic appliance (Figure 7);

This is not true. First Wool's invention is an orthodontic arch wire 10 that is stated repeatedly throughout the patent. Note, for example, in claim 1, Col.7, line 37: "an orthodontic arch wire....". The arch wire 10 in fig. 7 is placed within the bracket 38 slot and becomes **an integral part of** the fixed orthodontic. The Wool arch wire 10 **does not become curved** as it is placed upon the orthodontic appliance; it is formed curved in the shape of an ideal dental arch form **prior** to placement as is clearly disclosed by Wool in Figs. 1 and 10.

Claim 1 in the present invention the wire is formed straight: ln.5 "the longitudinal body is straight".

Claim 7 in the present invention the wire is formed: lns. 5 and 6 : "curved with a flat occlusal plane with the ends crossed over each other".

tying means for attaching the accessory arch bar to an orthodontic appliance,

There is a similarity, but in the present invention the arch bar is in a different position in relation to the brackets (not within the bracket slots as the Wool arch wire is).

wherein a wire ligature is used to attach the arch bar

Wool does not disclose an arch bar. Wool discloses an arch wire 12, which fits within the bracket slot, being attached with a wire ligature. Wool does not disclose a wire ligature attaching an arch bar and arch wire jointly.

to an orthodontic bracket (Figure 7); and a cross-sectional diameter in the range of 0.020 inches to 0.60 inches (col 6, ln 25).

Wool in col. 6, line 25 states 0.022 inch only. The vertical dimension of an orthodontic bracket slot is .022 inch maximum. The Wool arch wire cannot exceed this size or it won't fit within the bracket slot. The Wool arch wire cannot exceed this size as the present invention does where it is up to 0.060 inch. The fact that Wool discloses an arch wire size within the ".020"- ".060" range does not mean he has

disclosed or inferred an accessory arch bar which is not limited by the maximum size of a bracket slot (.022"). This wire size range is one of the novelties of the current invention. The inventor found unexpected results when using a .027 inch diameter wire. The dental arch width widened when a straight .027 inch wire was placed on a fixed orthodontic appliance for six weeks. The range should have been amended to .025 inch to .060 inch.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the....claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Re Claim 1 in the present application Wool does not disclose, expressly or inherently, an accessory (or piggybacked) arch bar with a cross-sectional diameter of .022"-.060" fixed to a fixed orthodontic appliance. Further, Wool does not disclose a wire ligature attaching an arch bar to an arch wire.

Re claim 3 Wool does not disclose an arch bar, but does disclose metal compositions. Wool has not disclosed both elements. Claim 3 is dependant to claim 1 and includes all its limitations. If claim 1 is allowable, Claim 3 is allowable.

In re claim 7, Wool shows an arch bar attached to a fixed orthodontic appliance by piggybacking on the labial side of the installed appliance (Figure 7),

This as been discussed above. Wool in Fig. 7 discloses an arch wire which is part of an installed appliance. Note the arch wire is within the bracket slot (especially note Fig. 8, 57) where it becomes a necessary component of a fixed orthodontic appliance. Wool does not disclose a piggybacked arch bar which is external to the bracket arch wire slot and external to the fixed orthodontic appliance as described above. ("A claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the....claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).)

comprising a metal wire with a longitudinal body having opposing longitudinal ends

(Figure 1),

Wool Fig. 1 does not disclose ends as the present invention does in Fig. 1. Wool does disclose ends; but, they are not longitudinally opposing each other. The wire in Wool is curved in the shape of a dental arch with the ends parallel to each other. Claim 7 of the present application, states; “the ends approximate or cross over each other”.

a cross-sectional diameter (Figure 3),

Wool discloses a round diameter in Fig. 3 and a rectangular diameter in Fig. 4. Orthodontic wires come in these two configurations. This would be true in the present invention except for the actual size.

and the longitudinal body is curved on a flat plane (Figure 1);

The arch bar in the present application is shown in Fig. 5A. Compare Fig. 5A with Wool’s Fig. 1. Both are curved on a flat plane; but each with a distinctly different curve.

a longitudinal length similar to the length of an arch wire on a fixed orthodontic appliance (Figure 7);

Fig. 7 does disclose some form of tying means that the present invention claims.

tying means for attaching the accessory arch bar to an orthodontic appliance, wherein a wire ligature is used to attach the arch bar to an orthodontic bracket (column 4, lines 9-11);

The tying means in Wool is used to attach an arch wire not an accessory arch bar; but is the same.

and a cross-sectional diameter in the range of 0.020 inches to 0.60 inches (col 6, In 25).

As discussed above, Wool discloses 0.022 inches only which is the largest wire Wool can possibly use.

Re claim 7 Wool does not expressly or inherently describe:

an accessory arch bar; or

an arch bar with a cross-sectional diameter range of .020”-.060”.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the....claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

4. (Same) Claims 13, 16, 19, 21-22, 25 and 27-28 are rejected under 35 U.S.C. 102(b) as being anticipated by White (6,431,861). In re claim 13, White discloses an arch bar attached to a fixed orthodontic appliance (Figure 3)

Claim 13 claims an accessory or piggybacked arch bar. As discussed above, the terms **accessory** and **piggybacked** are synonymous; and the terms **fixed orthodontic appliance** and **installed orthodontic appliance** are synonymous. This applies to claim 13 in the present application. White in Figs. 3A and 3B (there is no Fig. 3) discloses an arch wire, not an arch bar, engaged within the slots of orthodontic brackets. A Dictionary of Dental Terms by Rich Masel defines arch wire as “A metal wire which is attached to orthodontic brackets to move teeth” and a dental bracket as “a metal or ceramic part that is glued onto a tooth and serves as a means of fastening the arch wire”. The White arch wire is sized to fit within a .022 inch slot per Col. 6, lines 2-3: “---diameter of between about 0.12” and 0.022”. As discussed previously in the present invention the accessory arch bar in the present invention is not enclosed within the bracket slot which allows for an additional wire and much larger wire with greater strength.

comprising a metal wire with a longitudinal body having opposing ends (Figure 1-2);

In claim 13 in the present invention the arch bar has similar ends.

a cross sectional diameter (col 6, In 2-3);

This is similar. Note in claim 7, line 7 of the White disclosure as is continued: “.....**a cross- section and diameter between about 0.012” and 0.020”**”. Note in claim 7, line 7 of the present invention: “**a cross-sectional diameter of .020” to .060”**”. White is not teaching or anticipating wires which exceed the size of an orthodontic bracket slot (.022”).

and a longitudinal axis (Figure 1).

This is similar. In conclusion, White, for the above reasons, does not teach or suggest each and every element of claim 13.

Re Claim 13 White does not expressly or inherently describe:
accessory (piggybacked) arch bar.

(Verdegaal Bros. v. Union Oil of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).
“The identical invention must be shown in as complete detail as is contained in the....claim.”
Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

It should be noted that applicant is claiming an article of manufacture and not the process of forming/making the device, accordingly, the manner in which the device is formed, i.e. forming the desired dental arch shape "with" a flat occlusal plane, is given little weight. *In re Fessmann*, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974).

Claim 13 describes how the arch bar is used, not how the wire is actually formed. In the field of orthodontics the word “forming” of a wire refers to bending of the wire, not how the wire is actually made. How the arch bar is used should be given weight. If a structure is identical to the prior art it may still be patentable if a new use is found for that structure. Section 101 of the patent statutes clearly states that **any new use** of a machine, article of manufacture, and the like is patentable subject matter. Pfeiffer, 135 USPQ at 33. MPEP 706.03(a) states: “The term “**process**” as defined in 35 U.S.C. 100, means process, art or method and **includes a new use** of a known process, machine, manufacture, composition of matter, or material.” U.S.C. 100 (b) states: “The term “process” means process, art or method and includes a **new use** of a known process, machine, **manufacture**, composition of matter, or material.” U.S.C. 101 states: “Whoever invents or discovers any new and **useful process**, machine, manufacture, or composition of matter, any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions of this title. The above is affirmed in Alappat, 33F.3d at 1542, 31 USPQ2d at 1556.

In the present invention the novelty is the new use of an orthodontic wire where it has a similarity to an orthodontic arch wire; but, its size range may far exceed that of an arch wire and it is installed to a set of braces outside (piggybacked or accessory) the arch wire slot of the brackets.

In re claims 16, 22 and 28, White discloses the composition of the dental arch bar is stainless steel (col 1, In 38).

Claims 16, 22 and 28 claim an arch bar that is “accessory” or “piggybacked” which White does not disclose.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the....claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

White discloses in col. 1, line 38, “particular monolithic stainless steel archwires” which would be the same.

Re Claims 16, 22 and 22 further define the invention and include all the limitations of their respective independent claims they are dependent upon, making them allowable if the independent claims are allowable. (35 U.S.C. 112).

In re claims 19 and 25, White discloses the arch bar as previously described, as well as shows the wire is curved either upwards or downwards away from the flat plane in the direction that the occlusal plane of the teeth is to be moved (col 5, In 54-59);

Col. 5, lines 54-59, “In the horizontal orthodontic archwire....” White discloses an **arch wire** which fits within the slot of an orthodontic bracket unlike the present invention in claims 19 and 26. The present application, as amended, claims an arch bar which is piggybacked on the cheek side of an installed archwire. White in Col. 1, lines 54-64, refers to Fig. 1A wherein the arch wire starts in the posterior at point 30 and proceeds upwards at points 24 and 26 where it proceeds downwards to point 22 which are better disclosed in Fig. 1B. Compare in the present invention the arch bar 1 in Fig. 7 moves upwards moves upwards as it goes to the front 50. Also note in Fig. 7 there is an existing archwire 11 in the bracket slots. Fig. 9 in the present invention discloses the arch bar going downward from back to front and note the archbar does not return upwards. Claim 19 in the present invention discloses the archbar bent downwards on one side and upwards on the opposite side. Claim 25 in the

present invention discloses either both sides bent upwards to the front or both sides bent downwards to the front.

The White arch wire bends are different than the bends in the present invention and the present invention is not an arch wire. The present invention is an arch bar as described above.

a longitudinal length similar to the length of an arch wire on a fixed orthodontic appliance (Figures 2-3);

White does not have Figs. 2 and 3; but White does disclose actual arch wires which are the length of arch wires because they are arch wires.

tying means for attaching the accessory arch bar to an orthodontic appliance, wherein a wire ligature is used to attach the arch bar to an orthodontic bracket (col. 7, ln. 10-11);

The tying means is similar; but White discloses an arch wire, not an arch bar. White states in Col. 7, lines 8-11: "To activate the arch wire 10a from its passive state (as shown by phantom line in FIG. 3A) to the illustrated active state, the archwire 10a may be interconnected (e.g., via ligation) to brackets mounted on the.....". Note White is referring to an arch wire which fits into the slots of the brackets. White does not disclose an arch bar which fits external (accessory or piggybacks) to the actual fixed orthodontic appliance. The tying means would be similar; but in White they are used to secure a single arch wire within a bracket slot, not to secure an arch bar and an arch wire simultaneously as in the present invention.

and a cross-sectional diameter range that is between 0.020 inches to 0.60 inches (col 3, ln 47-49).

White states an **arch wire** diameter of 0.012-0.022". White cannot exceed .022" because the arch wire cannot exceed 0.022" which is the maximum size of a bracket slot which the arch wire must fit within. The present invention had unexpected results when a .027 inch arch bar was used. Arch bars and arch wires are distinctly different and the diameter ranges are different. The use of the large wires, which White is not able to use, is one of the novelties of the present invention.

Re claim 19 and 25 White does not expressly or inherently disclose:

an accessory (or piggybacked) arch bar;

and cross-sectional diameter of .020”-.060”.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the....claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

In re claims 21 and 27, White discloses the composition of the arch bar is comprised of metal compositions (col 3, ln 50-54).

White describes metal or metal alloys These broad categories would arguably include the present invention.

Re claim 21: is dependent to independent claim 19; claim 21 includes all the limitations of claim 19, if claim 19 is allowable claim 21 is allowable. (35 U.S.C. 112).

Re claim 27: is dependent to independent claim 25; claim 27 includes all the limitations of claim 25 if claim 25 is allowable claim 27 is allowable. (35 U.S.C. 112).

5. (Same) Claim 31 is rejected under 35 U.S.C. 102(b) as being anticipated by Kesling (4,676,747). Kesling discloses using an accessory arch bar for placing orthodontic force upon the teeth

Kesling very specifically discloses torquing auxiliaries which are secured to the braces as in Col. 4, **mounted in archwire slots of the brackets**, lines 29-33: “.....(or) leave the main archwire alone in the archwire slot and mount the auxiliary in pins which are suitably interconnected to the brackets.” The shape of the auxiliary is disclosed in Col. 4, lines 54-58: “The cross-sectional shape of the wire auxiliary,.....Preferably, this shape will be rectangular or square.” The present invention is not capable of torquing the teeth. In Kesling the rectangular or square cross-sectional wire must engage a bracket slot of the same shape in a twisting or torquing manner in order to torque (push the roots towards the tongue) the teeth. **The present invention, accessory arch bar, does not engage the bracket slot** as Kesling states in claim 31, line 5: “placing the accessory arch bar adjacent to the cheek side of an orthodontic appliance”.

consisting of forming a longitudinal arch bar into a pre-determined shape (Figure 2/Column 3, Lines 51-53);

The “form of an arcuate wire” in line 52 is similar but “for applying a torquing force” in lines 52-53 is not. The present invention does not require a wire rectangular or square in cross-section. The Kesling wire must be formed in a fourth dimension, twisting the wire axially.

placing the bar adjacent to the cheek side of an arch wire of an orthodontic appliance (Figure 3);

Fig. 3 discloses a Begg appliance which is probably no longer used anywhere in the world. The torquing wire 20P is disclosed placed between the bracket and the bracket base. This is the **bracket slot which is actually vertical** wherein the arch wires are inserted from the vertical direction as disclosed in Fig. 3. The second arch wire in Fig. 3 is **within** the vertical bracket slot which has been designed to receive both archwires. The second wire in Fig. 3 is not mounted on the cheek side. The Begg appliance has dual arch wires which both fit within the bracket slot which makes both wires part of the fixed orthodontic appliance. Neither wire can be considered an accessory or piggybacked wire.

and ligating the bar to an orthodontic appliance (col 2, lines 3-8).

Col. 5, lines 49-50, state: “.....connected to the bracket by means of a lock pin 26, as seen in Fig. 4.” The present invention does not disclose a locking pin. The locking pin was used in the Begg appliance which is shown in Fig. 4 in Kesling. Merriam-Webster defines ligate: “to tie with a ligature”. Merriam-Webster further defines a ligature: “a filament such as a thread”.

Re claim 31 Kesling does not expressly or inherently describe:

- an **accessory** (piggybacked) **arch bar**;
- placed over the **cheek side** of an arch wire;
- and does not disclose a **ligating** means.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the....claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim Rejections—35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I am responding with the following law in mind:

Prima Facie Obviousness

1. Some suggestion or motivation.....to modify.....combine.
2. Reasonable expectation of success.
3. Prior art must teach or suggest all the claim limitations MPEP § 2143.03.

MPEP § 2144.05

Prima Facie Obviousness may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention (In re Geisler).

706.02(j) Contents of a 35 USC 103 Rejection

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must **expressly or impliedly** suggest the claimed invention or the examiner **must present a convincing line of reasoning** as to why the artisan would have found the claimed invention to **have been obvious** in the light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

The court of customs and patent appeals has stated that a prima facie case of obviousness can be rebutted if the applicant (1) can establish "the existence of **unexpected properties in the range claimed**" or (2) can show "that the art in **any material way taught away**" from the claimed invention. In Re Malagari, 499 F.2d at 1303, 182 USPQ at 553 & Inter. 1985).

6. (New same wording, but substituted Wool for Terramoto) **Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wool in view of Moss (3,315,359). Wool discloses a dental arch bar as previously described, but is silent as to having ends of said bar that are formed at a right angle to the bar's long axis and directed towards the teeth.**

Wool does not disclose an accessory (or piggybacked) arch bar. As discussed above, Wool discloses an arch wire (not an arch bar) sized to fit within the slot of an orthodontic bracket, not an accessory arch bar as in the present invention. The arch wire is part of the fixed orthodontic appliance.

Moss, however, teaches bending the ends of an orthodontic arch wire at right angles to form secure end sections (col 2, In 57-60).

Claim 2 in the present invention claims a right angle bend to prevent irritation to the patient and to **prevent dislodging of the end of the arch bar from the tying means** (Fig. 5C). In the present invention Fig. 5C discloses the ends of the arch bar **bent in at right angles 30 towards the teeth**. One purpose of the bend is the tie wire pictured **won't slide off the end of the archwire 11**. Moss's patent discloses as described in Col. 1, lines 53-55: ".....a bundle of very fine wires, each of which is capable of substantial resilient flexure.....". Lines 59-60 in Col. 2 state: ".....bent **upwards** at right angles to form end sections **as at 15a**". Col. 2, lines 55-56 disclose: "The end sections 15a of the wire are affixed to the tubes 16 by means of soldering." This is disclosed in Figs. 3, 4, 5 and 6. This bundle of wires is very flexible and tends to bend somewhat like a rubber band. Once bent the flexible wire is not rigid enough to hold the bend; therefore, to secure it to the tube 16 it must be soldered to the tube 16. The end bend in the flexible wire does nothing to make the end of the wire more secure. The bend only functions to place the wire in proximity of the tube 16 so it may be soldered to it. The soldering is necessary for headgear, Fig. 6, force be transmitted to the flexible wire 15, described in Col.3, lines 58-64. Further, Moss's bend is in an upward direction as opposed the inwards bend in the present invention.

Wool in view of Moss does not teach or suggest the bent wire end in claim 2 for the same reasons stated in the present invention. (Prior art must teach or suggest all the claim limitations MPEP § 2143.03.). Further, claim 2 refers to and includes all the limitations of claim 1; therefore, claim 2 is allowable if claim 1 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15).

As discussed above, the Moss right angle does not produce a more secure end section but allows the end of the wire to be in position to be soldered. Note in Fig.4 the bent wire 15a enters the tube 16 and must be soldered. The soldering is necessary, because of the extreme flexibility (see above) of the wire, makes the end of the wire secure. The bend of the wire does not make the wire more secure.

(Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to form right angles in the end sections of the arch bar in order to create secure end sections that do not irritate the inside portions of a patient's mouth as taught by Moss.

Re claim 2; Wool in view of Moss does not teach or suggest the following limitations :

An accessory arch bar;

Ends bent at right angles towards teeth to prevent a tie wire (securing the arch bar to the arch wire) from slipping off the end of the arch bar.

{Prior art must teach or suggest all the claim limitations MPEP § 2143.03).

Further claim 2 includes the limitations of independent claim 1. If claim 1 is allowable then claim 2 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

7. (New) Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wool in view of White. Wool discloses an arch bar as previously described, but fails to disclose the bar is comprised of stainless steel.

As discussed above Wool does not disclose an arch bar. Wool discloses an arch wire sized to fit within the slot of an orthodontic bracket, not an accessory arch bar as in the present

invention.

White, however, teaches an arch bar that is comprised stainless steel (col. 4, 1n. 20).

White discloses an arch wire, not an arch bar. Refer to Whites claim 1, Col. 8, lines 62-63 : “What is claimed is : **“An.arch wire....”**”.

therefore, it would have been obvious to one having ordinary skill in the art at the time of Applicant's invention to make the arch bar out of stainless steel in order to ensure the bar can manipulated to lie within a flat plane or can substantially follow a continuous curved shape as taught by White.

Re claim 4: Wool in view of White does suggest stainless steel but does not suggest or teach the the limitations of claim 1 which claim 4 refers to:

If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15. The prior art, Wool and Moss, do not teach or suggest the limitations of claim 1. {Prior art must teach or suggest all the claim limitations MPEP § 2143.03}.

8. (Was Terramoto rest same) Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wool. Wool discloses an arch bar as previously described, but fails to disclose the specific cross-sectional diameter of the arch bar is 0.027 inches. Although, Wool does disclose a cross-sectional diameter of the arch bar to be about 0.022 inches (col 6,1n 25). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the cross-sectional diameter 0.027 inches since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As discussed above, the maximum orthodontic bracket slot size is 0.022”. The Wool wire must fit into the slot; therefore cannot exceed 0.022” in cross-section. A person of ordinary skill in the art would never consider an arch wire size such as .027” due to the fact there are no bracket arch wire slots made in the field that are large enough to receive an .027” wire. A person of ordinary skill in the art would not find a wire .027 inch obvious. In fact they could not even imagine a .027 inch wire because the arch

wire of Wool must fit within a bracket slot which has a maximum size of .022 inch. Claim 5 is dependent to claim 1 and as such includes all the limitations of claim 1. If claim 1 is allowable claim 5 is allowable. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.

9. (New used Wool instead of Terramoto-rest same) Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wool in view of Kelly (6,095,809). In re claim 6, Wool discloses a dental arch bar as previously described,

Wool, as previously discussed, did not describe an arch bar.

but is silent as to the composition of the bar being Ti beta 3. However, Kelly teaches an orthodontic arch bar that is comprised of beta-titaniums (col 5, ln 46-52). Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to make the arch bar comprise of Ti beta 3 in order provide a sufficient stiffness and flexibility for the bar to operate as taught by Kelly.

Both Wool and Kelly have been discussed above. As discussed, Wool does not teach anything involving stiffness necessary for an accessory bar which moves teeth due to the fact the accessory bars exceed the maximum cross-section of wires used in Wool and Kelly which is .022". Kelly only discloses arch wires.

Claim 6 includes all the limitations of independent claim 1 which it refers to. Assuming claim 1 is allowable, claim 6 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.). Prior art must teach or suggest all the claim limitations MPEP § 2143.03).

10. (Same) Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wool in view of Moss. In re claim 8, Wool discloses a dental arch bar as previously described, but is silent as to having ends of said bar that are formed at a right angle to the bar's long axis and directed towards the teeth.

The following discussion is the same as claim 2 above.

Wool does not disclose an accessory (or piggybacked) arch bar. As discussed above, Wool discloses an arch wire (not an arch bar) sized to fit within the slot of an orthodontic bracket, not an accessory arch bar as in the present invention. The arch wire is part of the fixed orthodontic appliance.

Moss, however, teaches bending the ends of an orthodontic arch wire at right angles to form secure end sections (col 2, In 57-60).

Claim 8 in the present invention claims a right angle bend to prevent irritation to the patient and to **prevent dislodging of the end of the arch bar from the tying means** (Fig. 5C). In the present invention Fig. 5C discloses the ends of the arch bar **1 bent in at right angles 30 towards the teeth**. One purpose of the bend is the tie wire pictured **won't slide off the end of the archwire 11**. Moss's patent discloses as described in Col. 1, lines 53-55: "a bundle of very fine wires, each of which is capable of substantial resilient flexure.....". Lines 59-60 in Col. 2 state: ".....bent **upwards** at right angles to form end sections **as at 15a**". Col. 2, lines 55-56 disclose: "The end sections 15a of the wire are affixed to the tubes 16 by means of soldering." This is disclosed in Figs. 3, 4, 5 and 6. This bundle of wires is very flexible and tends to bend somewhat like a rubber band. Once bent the flexible wire is not rigid enough to hold the bend; therefore, to secure it to the tube 16 it must be soldered to the tube 16. The end bend in the flexible wire does nothing to make the end of the wire more secure. The bend only functions to place the wire in proximity of the tube 16 so it may be soldered to it. The soldering is necessary for headgear, Fig. 6, force be transmitted to the flexible wire 15, described in Col.3, lines 58-64. Further, Moss's bend is in an upward direction as opposed the inwards bend in the present invention.

Wool in view of Moss does not teach or suggest the bent wire end in claim 8 for the same reasons stated in the present invention. (Prior art must teach or suggest all the claim limitations MPEP § 2143.03.). Further, claim 8 refers to and includes all the limitations of claim 7; therefore, claim 8 is allowable if claim 1 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F .2d 1071, 5 USPQ2d 15).

As discussed above, the Moss right angle does not produce a more secure end section but allows the end of the wire to be in position to be soldered. Note in Fig.4 the bent wire 15a

enters the tube 16 and must be soldered The soldering is necessary, because of the extreme flexibility (see above) of the wire, makes the end of the wire secure. The bend of the wire does not make the wire more secure.

(Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to form right angles in the end sections of the arch bar in order to create secure end sections that do not irritate the inside portions of a patient's mouth as taught by Moss.

Re claim 8; Wool in view of Moss does not teach or suggest the following limitations :

An accessory arch bar;

Ends bent at right angles towards teeth to prevent a tie wire (securing the arch bar to the arch wire) from slipping off the end of the arch bar.

{Prior art must teach or suggest all the claim limitations MPEP § 2143.03).

Further claim 8 includes the limitations of independent claim 7. If claim 7 is allowable then claim 8 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

11. **(Same)Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wool in view of Miura (5,017,133). In re claim 9, Wool discloses a dental arch bar as previously described, but is silent as to having ends of said bar that are looped towards the teeth when placed on an orthodontic appliance.**

Wool has been discussed above as disclosing an arch wire, not a piggybacked (or accessory) arch bar as in the present invention. As discussed above Wool does not loop the bend towards the teeth.

Miura, however, teaches bending the ends of an orthodontic arch wire into loops (Figures 2-3) wherein the loop can encircle an orthodontic wire or bracket hook.

Miura's invention is an arch wire, Col. 1, lines 6-7. Miura's arch wire cannot circle another orthodontic arch wire because **it is the arch wire** and a second arch wire is not disclosed. Figs. 2 and 3 in Miura disclose an arch wire passing through the distal (back of the mouth) of a buccal tube. A buccal

tube is sized to fit standard orthodontic archwires; but, is a tube. Note in Miura Col. 2 , lines 17-20, “The distal ends (of the archwire) are the archwires are therefore deformable into shapes to prevent them from slipping through orthodontic appliances (buccal tube) when mounted thereto. The Miura invention is no more than heating the ends of highly resilient archwires to allow them to be bent. The posterior of an orthodontic appliance usually contain a tube to retain the archwire. The highly resilient wires tend to pull out of the tube during patient use. The posterior bend of the wire exiting the tube accomplishes prevents the archwire from pulling out of the tube. Miura doesn’t disclose the bent wire hooking to a hook or encircling an orthodontic wire. The Miura wire is not an accessory wire, it is an archwire and the only wire disclosed in the drawings. The present invention archbar does not enter a bracket tube which can only hold a wire with a maximum size of .022”. Figs. 2 in Miura discloses a loop which is upwards and downwards, not towards the tooth and the loop does not encircle an arch wire. Fig. 3 discloses a wire that goes upwards only and does not circle back on itself.

Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to form loops in the end sections of the arch bar in order to secure said end sections and prevent the arch bar from slipping through the brackets as taught by Miura.

Wool in view of Miura does not teach or suggest the limitations of claim 9 as discussed above. (Prior art must teach or suggest all the claim limitations MPEP § 2143.03). Therefore, it would not be obvious to one having ordinary skill in the art at the time of the applicant's invention to form loops in the end sections of the archbar in order to secure the archbar to an installed archwire. Wool and Miura teach archwires which fit within bracket slots; therefore, don’t need a loop to attach to themselves.

Re claim 9: Wool in view of Miura does not teach or suggest the following limitations of claim 9:

- accessory arch bar;**
- ends looped towards teeth;**
- loop encircles an arch wire.**

Further claim 9 includes the limitations of independent claim 7. If claim 7 is allowable then claim 9 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

12. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wool in

view of Kelly (6,095,809). In re claims 10 and 12, Wool discloses a dental arch bar as previously described,

As discussed, Wool discloses an arch wire, not an arch bar.

but is silent as to the composition of the bar. Kelly, however, teaches an orthodontic arch bar that is comprised of metal compositions, including beta-titaniums (col 5, In 46-52).

Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to make the arch bar comprise of metal compositions (i.e. Ti beta 3) in order provide a sufficient stiffness for the bar to operate as taught by Kelly.

Both Wool and Kelly have been discussed above. As discussed, neither Kelly nor Wool teach anything involving stiffness necessary for an **accessory bar** which moves teeth due to the fact the accessory bar is .020”-.060” which, the majority, exceeds the maximum cross-section of wires used in Wool and Kelly which is .022”.

Metal compositions including Ti beta 3 are well known in the art for **arch wires**.

Both claims 10 and 12 include all the limitations of independent claim 7 which they refer to. Assuming claim 7 is allowable, claims 10 and 12 are allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

In re claim 10: Wool in view of Kelly does teach or suggest the limitations of claim 10 combined with the limitations of claim 7.

In re claim 12: Wool in view of Kelly does teach or suggest the limitations of claim 12 combined with the limitations of claim 7.

13. (Same) Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wool. Wool fails to disclose the specific cross-sectional diameter of the arch bar is 0.027 inches, though Wool does disclose a cross-sectional diameter of the arch bar to be 0.022 inches (col 6, In 25).

The maximum wire size in Wool is .022 “ as discussed above. Wool in view of Miura does not teach or suggest the limitations of claim 9. {Prior art must teach or suggest all the claim limitations MPEP § 2143.03).

Col. 6, lines 21-25, states: “.....diameter of cross-sections of the posterior segments is 0,018 inch, the width of the anterior segment is 0.010 inch, and the height of the cross-sections of the anterior segment is 0.022 inch.” Col. 1, line 13, states: “...orthodontic arch wire...”. Wool teaches away from a diameter of 0.027 inch. **MPEP § 2144.05** Prima Facie Obviousness may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention (In re Geisler).

Therefore, it would not be obvious to one having ordinary skill in the art at the time of the applicant's invention to form loops in the end sections of the archbar in order to secure the archbar to an installed archwire. Wool and Miura teach archwires which fit within bracket slots; therefore, don't need a loop to attach to themselves. Further claim 9 includes the limitations of independent claim 7. If claim 7 is allowable then claim 9 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the cross-sectional diameter 0.027 inches

Not only not obvious; but, impossible. Wool inherently teaches away from a .027” diameter wire because of the impossibility. The Wool wire must fit within a bracket slot which has a maximum size of .022”. This impossibility demonstrates the novelty of the present invention. Wool does not suggest or motivate a person of ordinary skill in the art in the art to make a wire .027” in diameter because the arch wires Wool discloses cannot exceed the size of a bracket slot.

since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As discussed above the optimum value for the wire diameter in Wool cannot exceed 0.022”. A person of routine skill in the art would not know what to do with a 0.027” wire on a fixed orthodontic appliance. It would not have been obvious to a person having ordinary skills in the art when viewing White to use a wire that exceeded the diameter size that would fit into any

known orthodontic appliance. (Prior art must teach or suggest all the claim limitations MPEP § 2143.03).

14. (Same) Claims 14, 20 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Moss. In re claims 14, 20 and 26, White discloses a dental arch bar as previously described, but is silent as to having ends of said bar that are formed at a right angle to the bar's long axis and directed towards the teeth.

White, as discussed above, involves an archwire with a wire maximum cross-section of 0.022" because the wire must fit within the slot of an orthodontic bracket.

Moss, however, teaches bending the ends of an orthodontic arch wire at right angles to form secure end sections (col 2, ln 57-60).

Claims 14, 20 and 26 claim an arch bar which bent at a right angle towards the teeth to prevent dislodging of the end of the arch bar from the tying means which secure s the arch bar to an arch wire. Moss teaches bending the end of a highly flexible wire upwards in order to solder to a bar above it. As discussed above, the end of the Moss wire is made more secure by soldering the wire to the bar 16. The bend in the Moss wire does not make it more secure. Further, as discussed above, the Moss bends are not towards the teeth. The bends are upwards.

Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to form right angles in the end sections of the arch bar in order to create secure end sections that do not irritate the inside portions of a patient's mouth as taught by Moss.

As discussed above, Moss did not teach either of these purposes. White discloses arch wires which fit a .022" bracket slot, Moss discloses an arch wire bent at a right angle, not towards the teeth (not directed towards the teeth), in order to solder the end of the wire to another wire. A person of ordinary skill in the art would not view White in view of Moss and find they teach or suggest the claim limitations of claims 14, 20 and 26 wherein an accessory bar is piggybacked on an installed arch wire and the distal ends of the archbar are bent at a right angle in order to prevent a tie wire connecting the archbar to the arch wire from being dislodged. (Prior art must teach or suggest all limitations of the claim. MPEP § 2143.03. In re Wilson, 424 F.2d1382, 1385, 165 USPQ 494 (CCPA 1970).

Re claim 14: White in view of Moss does not teach or suggest the claim limitations of;
end of arch bar directed towards teeth;
bend prevents dislodging of arch bar from tying means;
limitations of claim 13.

Re claim 20 White in view of Moss does not teach or suggest the claim limitations of;
end of arch bar directed towards teeth;
bend prevents dislodging of arch bar from tying means;
limitations of claim 19.

Re claim 26: White in view of Moss does not teach or suggest the claim limitations of;
end of arch bar directed towards teeth;
bend prevents dislodging of arch bar from tying means;
limitations of claim 25.

15. (Same) Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Miura. In re claim 15, White discloses a dental arch bar as previously described, but is silent as to having ends of said bar that are looped towards the teeth when placed on an orthodontic appliance.

Discussed above claim 9.

Wool has been discussed above as disclosing an arch wire, not a piggybacked (or accessory) arch bar as in the present invention. As discussed above Wool does not loop the bend towards the teeth.

Miura, however, teaches bending the ends of an orthodontic arch wire into loops (Figures 2-3) wherein the loop can encircle an orthodontic wire or bracket hook.

Miura's invention is an arch wire, Col. 1, lines 6-7. Miura's arch wire cannot circle another orthodontic arch wire because **it is the arch wire** and a second arch wire is not disclosed. Figs. 2 and 3 in Miura disclose an arch wire passing through the distal (back of the mouth) of a buccal tube. A buccal tube is sized to fit standard orthodontic archwires; but, is a tube. Note in Miura Col. 2, lines 17-20, "The distal ends (of the archwire) are the archwires are therefore deformable into shapes to prevent them from slipping through orthodontic appliances (buccal tube) when mounted thereto. The Miura invention is no more than heating the ends of highly resilient archwires to allow them to be bent. The

posterior of an orthodontic appliance usually contain a tube to retain the archwire. The highly resilient wires tend to pull out of the tube during patient use. The posterior bend of the wire exiting the tube accomplishes prevents the archwire from pulling out of the tube. Miura doesn't disclose the bent wire hooking to a hook or encircling an orthodontic wire. The Miura wire is not an accessory wire, it is an archwire and the only wire disclosed in the drawings. The present invention archbar does not enter a bracket tube which can only hold a wire with a maximum size of .022". Figs. 2 in Miura discloses a loop which is upwards and downwards, not towards the tooth and the loop does not encircle an arch wire. Fig. 3 discloses a wire that goes upwards only and does not circle back on itself.

Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to form loops in the end sections of the arch bar in order to secure said end sections and prevent the arch bar from slipping through the brackets as taught by Miura.

Wool in view of Miura does not teach or suggest the limitations of claim 15 as discussed above. (Prior art must teach or suggest all the claim limitations MPEP § 2143.03). Therefore, it would not be obvious to one having ordinary skill in the art at the time of the applicant's invention to form loops in the end sections of the archbar in order to secure the archbar to an installed archwire. Wool and Miura teach archwires which fit within bracket slots; therefore, don't need a loop to attach to themselves.

Re claim 15: Wool in view of Miura does not teach or suggest the following limitations of claim 13:

- accessory arch bar;
- ends looped **towards** teeth;
- loop **encircles** an **arch wire**.

Further claim 15 includes the limitations of independent claim 13. If claim 13 is allowable then claim 15 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

Miura, however, teaches bending the ends of an orthodontic arch wire into loops (Figures 2-3) wherein the loop can encircle an orthodontic wire or bracket hook.

Discussed above.

Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to form loops in the end sections of the arch bar in order to secure said end sections and prevent the arch bar from slipping through the brackets as taught by Miura.

As discussed above, Moss did not teach either of these purposes. White discloses arch wires which fit a .022" bracket slot, Moss discloses an arch wire bent at a right angle in order to solder the end of the wire to another wire. A person of ordinary skill in the art would not view White in view of Moss and find they teach or suggest the claim limitations of claims 14, 20 and 26 wherein an accessory bar is piggybacked on an installed arch wire and the distal ends of the arch bar are bent in a loop towards the teeth which encircles the arch wire in order to prevent a tie wire connecting the archbar to the arch wire from being dislodged. Further, looping an arch wire with an arch bar is not inherent in Moss (MPEP 2131.01) because Moss only discloses an arch wire, not an arch bar. (Prior art must teach or suggest all limitations of the claim. MPEP § 2143.03. *In re Wilson*, 424 F.2d1382, 1385, 165 USPQ 494 (CCPA 1970).

16. (Same) Claims 17, 23 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over White. White discloses an arch bar as previously described but fails to disclose the specific cross-sectional diameter of the arch bar is 0.027 inches, though White does disclose a cross-sectional diameter of the arch bar to be between about 0.012 inches and 0.022 inches (col. 3, In 47-49). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the cross-sectional diameter 0.027 inches since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As discussed above, White discloses an arch wire which cannot exceed 0.022" in diameter because it must fit within a bracket slot which is 0.022". White inherently teaches away from a .027" wire because the White arch wire must fit within a bracket slot which fits within a bracket slot which has a maximum size of .022". (MPEP § 2144.05 Prima Facie Obviousness may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention (*In re Geisler*). Viewing White a person of ordinary skill in the art would not make a wire 0.027" in diameter because it would not fit the slot of standard orthodontic brackets. Claim 17 includes the limitations of independent claim 13, as is true of claim 23 to claim 19 and

claim 29 to 25. If claims 13, 19 and 25 are allowable claims 17, 23 and 29 are allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

Re claim 17; White does not teach or suggest the claim limitations:

accessory bar;
diameter of 0.027 inch: and
limitations of claim 13.

Re claim 23: White does not teach or suggest the claim limitations:

accessory bar;
diameter of 0.027 inch: and
limitations of claim 19

Re claim 29: White does not teach or suggest the claim limitations:

accessory bar;
diameter of 0.027 inch: and
limitations of claim 25.

17. (Same) Claims 18, 24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Kelly. In re claims 18, 24 and 30, White discloses a dental arch bar as previously described, but is silent as to the composition of the bar being Ti beta 3.

White does not disclose an arch bar. Col. 5, lines 54-59, "In the horizontal orthodontic archwire...." White discloses an archwire which fits within the slot of an orthodontic bracket unlike the present invention in claims 19 and 26, as amended, claims an arch bar which is piggybacked on the cheek side of an installed archwire. White in Col. 1, lines 54-64, refers to Fig. 1A wherein the starts in the posterior at point 30 and proceeds upwards at points 24 and 26 where it proceeds downwards to point 22 which is better disclosed in Fig. 1B. Compare in the present invention the archbar 1 in Fig. 7 moves upwards moves upwards as it goes to the front 50. Also note in Fig. 7 there is an existing archwire 11 in the bracket slots. Fig. 9 in the present invention discloses the arch bar going downwards from back to front and note the archbar does not return upwards. Claim 19 in the present invention discloses the archbar bent downwards on one side and upwards on the opposite side. Claim

25 in the present invention discloses either both sides bent upwards to the front or both sides bent downwards to the front.

However, Kelly teaches an orthodontic arch bar that is comprised of beta-titaniums (col 5, In 46-52). Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to make the arch bar comprise of Ti beta 3 in order provide a sufficient stiffness and flexibility for the bar to properly operate as taught by Kelly.

Kelly, as discussed above, discloses an arch wire, not an accessory arch bar. A person of ordinary skill in the art would not view the stiffness and flexibility disclosed in Kelly which applies to an archwire which has a maximum diameter of 0.022" and find Ti beta 3 an obvious choice for a larger 0.027" wire.

Prima Facie Obviousness

1. Some suggestion or motivation.....to modify.....combine.
2. Reasonable expectation of success.
3. Prior art must teach or suggest all the claim limitations MPEP § 2143.03. *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494 (CCPA 1970).

Claims 18, 24 and 30 each include the limitations of the independent claims they refer to. Claim 18 refers to claim 17 which refers to claim 13, claim 24 refers to claim 23 which refers in turn to claim 19 and claim 30 refers to claim 29 which refers to claim 25. Claims 17, 23 and 29 claim an arch bar with a diameter of .027". White and Kelly inherently teach away from a .027" wire because the White and Kelly arch wire is limited by the maximum bracket slot size of .022". (MPEP § 2144.05 Prima Facie Obviousness may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention (*In re Geisler*)). If the respective independent claims are allowable the Claims 18, 24 and 30 include all the limitations of their independent claims and are allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

Re claim 18: White in view of Kelly does not teach or suggest the limitation of:
an arch bar: and
the limitations of claim 17.

Re claim 24: White in view of Kelly does not teach or suggest the limitation of:

an arch bar: and
the limitations of claim 23.

Re claim 30: White in view of Kelly does not teach or suggest the limitation of:
an arch bar: and
the limitations of claim 29.

Response to Arguments

18. Examiner herein acknowledges and approves all corrections relating to Applicant's claims rejected under 35 U.S.C. 112, however, as a result of the amended claims, a new ground of rejection under 35 U.S.C. 112 exists as described above.

19. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

This has been reargued above.

Applicant's arguments with respect to claims 7-31 have been fully considered but they are not persuasive.

This has been reargued above.

In regards to claim 7, Applicant remarks that Wool discloses both a round cross-sectional diameter and a rectangular cross-sectional diameter. As Applicant admits, the round cross-sectional diameter of Figure 3 is the same as the present invention.

This has been discussed above. Most wires have a round diameter. As stated above the size of the diameter is the issue.

The mere disclosure of the additional embodiment of a rectangular cross-sectional diameter by Wool does not render the claim unanticipated in light of the 1st embodiment as previously described.

The object in pointing out the rectangular cross-sectional diameter was to illustrate the Wool wire is an arch wire designed to fit within a bracket slot which are modernly all rectangular in shape. Rectangular wires produce a torquing pressure upon the roots of the teeth. Wool has been discussed above. In summary, Claim 7 in the present application has the following elements unanticipated by Wool: "Accessory" in preamble describing position of arch bar; "arch bar" describing wire is not an arch wire; and "a cross-sectional diameter of .020" to .060 in."

Additionally, Applicant does not positively claim the specific shape of the cross-section. Applicant also remarks that Wool does not disclose the cross sectional diameter is between 0.020 inches to 0.60 inches. However, as described above, since Applicant has not positively claimed any structural limitation relating to the shape of said cross-section, Wool's disclosure that the cross-section of a segment of the wire is 0.022 inches falls squarely within the Applicant's claimed range, and is thus anticipatory.

A diameter of .022" hardly falls **squarely** within a .022"-.060" range. Merriam-Webster Dictionary describes "squarely" as "in the middle". As discussed above the preferred embodiment in the present invention is .027". As has been suggested, changing the range to .025"-.060" would eliminate the discussion.

In response to Applicant's argument that the size of the wire is made to fit within the slot of a bracket, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art.

The patentability of a new use has been discussed. The structural difference is the diameter size of the arch bar may far exceed the diameter of an arch wire which has a limit of .022".

If the prior art structure is capable of performing the intended use, then it meets the claim.

The prior art structure is not capable of meeting the intended use of applying larger forces than arch wires can do to the teeth

With regard to claim 13, Applicant remarks that White discloses an archwire and not an arch bar, and that an archwire is a "metal wire which is attached to your brackets to move your teeth." However, the arch bar as claimed by Applicant recites the same structure (i.e. a metal wire that is placed on an orthodontic appliance and used to move teeth).

This has been discussed. Note in Claim 13 there is no mention of the arch bar being attached to brackets as an arch wire must be. Note in the application the arch bar may be tied to an arch wire instead of brackets.

Therefore, the arch bar as claimed by Applicant is structurally similar to the archwire disclosed by White, and thus White is considered anticipatory of Applicant's invention.

Not similar as discussed above.

Additionally, Applicant argues that White fails to disclose a wire which exceeds the size of an orthodontic bracket slot. However, Applicant is silent as to the specific size of the cross-section in the claim.

It is true the size is not disclosed; but the position (accessory or piggybacked) of the arch bar is disclosed. Note dependent claim 17 which refers to claim 13 claims a preferred embodiment of .027".

Examiner notes that Figure 1 A of White does indeed show the wire comprises a longitudinal axis which is especially evident at the opposing ends of said wire in the figure.

Furthermore, in regard to claims 19 and 25, Applicant remarks that said claims, "as amended, claim an arch bar which is piggybacked on the cheek side of an installed archwire" — of which Applicant asserts White fails to disclose. Examiner notes, however, that Applicant has not claimed

said piggybacking feature as just described. Instead, the amended portion of the claims read that the arch bar is piggybacked to an installed orthodontic appliance — in this case, a bracket as disclosed by White.

The amendment adding “piggybacked” to clarify for the examiner the term “accessory” and the rest of the disclosure in the application. As explained above, accessory and piggybacked are synonymous. Also as explained above an arch wire is part (included within) of the installed orthodontic appliance. The Applicant has claimed the piggybacking feature in claim 19 with the following: “accessory”, “attached to a fixed orthodontic appliance by piggybacking on the labial side of an installed orthodontic appliance (Note installed orthodontic appliance includes an arch wire by definition)”; and “attach the accessory bar to the orthodontic arch wire”.

Examiner also notes that the amended “piggybacking” feature has been given little patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

This has been discussed above and the appropriate cites have been referred to. Claims 19 and 25 their original forms depended upon the description “accessory”. As such it was intended to be given patentable weight and should be allowed as discussed above.

Additionally, Applicant remarks that the diameter of the cross-section as disclosed by White is between 0.012 inches and 0.022 inches and is therefore not anticipatory of the claimed diameter range of between 0.020 inches to 0.060 inches. Examiner reminds Applicant that the range disclosed by White still falls within the range of the claimed invention and therefore is indeed anticipatory.

This has been discussed above.

22. As to claim 31, Applicant remarks that Kesling discloses “torquing auxiliaries which are secured to the braces,” and that the present invention claims the arch bar is “used for placing

orthodontic force upon the teeth." Examiner notes that applying torque to a component is the same as applying a force in such a way as to produce rotation or torsion.

Not true. A torquing force does not apply a rotation to teeth and the term torsion is not used in the field of orthodontics. A torquing pressure applied to an upper front tooth moves the root towards the tongue. Modern braces involve rectangular bracket slots and wires rectangular in cross section. The rectangular arch wires are bent, for example, in the desired arch form (horizontal) with a flat occlusal plane (vertical). These bends will rotate teeth, move them forward and back, and up and down. Imagine all these movements have been made to the upper front teeth and the upper front teeth slant backwards towards the tongue. Now we need torquing or tipping the roots inwards. The edgewise (rectangular) wire is now twisted in cross-section with the appropriate torque. The torqued wire is now placed in the rectangular bracket slot and torquing pressures are placed upon the teeth. Note the wire must be placed within the bracket slot. The present invention as disclosed does not fit within the bracket slot and cannot apply torquing pressures. The point of the prior discussion of Kesling is his wires absolutely must fit within the bracket slot. The confusion is that Kesling is using a vertical slot as opposed to the more common, probably modernly universal, horizontal slot.

Applicant does not specifically claim what kind of force is applied to the teeth, thus applying a torsional force (aka torquing) as disclosed by Kesling is anticipatory of the claimed force applied.

The issue is where the wire is placed and what are its size constraints. Kesling does not disclose a wire as claimed in the present invention.

On a similar note, Applicant fails to positively claim the shape of the cross section. Hence, Applicant's argument that the present invention does not require a rectangular or square cross-section is moot.

As to Applicant's remarks that Figure 3 does not show the wire is placed on the cheek side of an arch wire of an orthodontic appliance, Kesling states that Figure 3 is only a fragmentary view and that the arch bar is capable of being placed anywhere along the teeth.

Note the vertical slots in Figs. 2, 3, 4, 6, 8, and 10. Also note the vertical locking pins 22 containing the pair of arch wires contained within the slot. Kesling means his wire in Fig. 3 may be placed on other teeth, but wherever they are placed they must be placed within the bracket slot.

Even still, Figure 3 clearly shows the cuspid teeth, which are adjacent the cheek side, are covered by said bar.

"Cheek side", as generally used, includes the lips in the anterior. In general terms, there is the tongue side and cheek side of teeth.

Lastly, Examiner notes that Applicant's arguments that the present invention does not disclose a locking pin are moot since the issue at hand is about ligating the accessory arch bar to the appliance.

There is some relevance because the locking pin is the ligation means in Kesling

Column 2, lines 3-8 of Kesling disclose that the arch bar can be connected to an orthodontic appliance by means of ligating.

23. In response to applicant's argument that "the Moss right angle does not produce a more secure end section but allows the end of the wire to be in position to be soldered," the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art

This right angle bends have been discussed above. The applicant does **not recognize any soldering advantage** as it would apply to the present invention.

cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

The differences have been discussed above.

24. As to claims rejected in view of Miura, Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

This has been discussed above, but below is a repeat of it.

Wool has been discussed above as disclosing an arch wire, not a piggybacked (or accessory) arch bar as in the present invention. As discussed above Wool does not loop the bend towards the teeth.

Miura, however, teaches bending the ends of an orthodontic arch wire into loops (Figures 2-3) wherein the loop can encircle an orthodontic wire or bracket hook.

Miura's invention is an arch wire, Col. 1, lines 6-7. Miura's arch wire cannot circle another orthodontic arch wire because **it is the arch wire** and a second arch wire is not disclosed. Figs. 2 and 3 in Miura disclose an arch wire passing through the distal (back of the mouth) of a buccal tube. A buccal tube is sized to fit standard orthodontic archwires; but, is a tube. Note in Miura Col. 2, lines 17-20, "The distal ends (of the archwire) are the archwires are therefore deformable into shapes to prevent them from slipping through orthodontic appliances (buccal tube) when mounted thereto. The Miura invention is no more than heating the ends of highly resilient archwires to allow them to be bent. The posterior of an orthodontic appliance usually contain a tube to retain the archwire. The highly resilient wires tend to pull out of the tube during patient use. The posterior bend of the wire exiting the tube accomplishes prevents the archwire from pulling out of the tube. Miura doesn't disclose the bent wire hooking to a hook or encircling an orthodontic wire. The Miura wire is not an accessory wire, it is an archwire and the only wire disclosed in the drawings. The present invention archbar does not enter a bracket tube which can only hold a wire with a maximum size of .022". Figs. 2 in Miura discloses a loop which is upwards and downwards, not towards the tooth and the loop does not encircle an arch wire. Fig. 3 discloses a wire that goes upwards only and does not circle back on itself.

Therefore, it would be obvious to one having ordinary skill in the art at the time of the applicant's invention to form loops in the end sections of the arch bar in order to secure said end sections and prevent the arch bar from slipping through the brackets as taught by Miura.

Wool in view of Miura does not teach or suggest the limitations of claim 9 as discussed above. (Prior art must teach or suggest all the claim limitations MPEP § 2143.03). Therefore, it would not be obvious to one having ordinary skill in the art at the time of the applicant's invention to form loops in the end sections of the archbar in order to secure the archbar to an installed archwire. Wool and Miura

teach archwires which fit within bracket slots; therefore, don't need a loop to attach to themselves. Further claim 9 includes the limitations of independent claim 7. If claim 7 is allowable then claim 9 is allowable. (If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 15.)

As admitted by Applicant, Miura teaches a motivation for looping the arch bar ends (column 2, lines 17-20).

Applicant did not admit there was anything in Miura that would motivate the applicant to bend the ends of an arch bar. Miura is not securing his wire to another wire. Miura is preventing Ni-Ti wires from slipping **out of the brackets** in the posterior area. Note the Miura wires are in the bracket slots. Refer to Miura: Col. 1, lines 48-59 , “ With known stainless steel orthodontic arch wires, the distal ends are typically bent into appropriate shapes to prevent them from slipping through the orthodontic **brackets** **B.**One problem with shape-memory alloy arch wires, such as Ni-Ti **arch wires**, is that it has not been possible to bend their distal ends to form stops.” Miura’s patent was a method of heat treating the Ni-Ti wire ends so these bends would be permanent. He actually deadened the wire making the Ni-Ti wire bendable.

The Miura wire has been discussed above.

Additionally, for all claims rejected in view of Kelly, Examiner notes that Kelly teaches a wire that is comprised of metal compositions as disclosed above in order to provide a sufficient stiffness for the bar to operate as described above.

This has been discussed. Kelly teaches cross-sectional configuration for arch wires. In Col. 5 , lines 47-53. Kelly a variety of metal compositions used in orthodontics. The composition of the arch bar in the present invention would fall within his general list.

In response to applicant's arguments against the references individually – i.e. Applicant's argument that Kelly discloses an arch wire and not an arch bar.– one cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The above section is from the MPEP. Keller and Merck are addressing the fact that with multiple references all references, rather than a single reference, must be used in the collective to prove non-obviousness. Of course, each reference must be discussed individually. There is no attack of the Kelly patent when it is pointed out that Kelly discloses an arch wire which is designed to fit within a bracket slot and Kelly does not teach suggest an arch bar which fits outside the bracket slot. Prior art must teach or suggest all the claim limitations MPEP § 2143.03. *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494 (CCPA 1970). If a prior art does not teach or suggest a claim limitation then it must be argued. The fact that Kelly only discloses an arch wire which fits into a bracket slot is an issue whether Kelly teaches or suggests the wire compositions in an arch bar in the present invention.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

706.07(a) Final Rejection, When Proper on Second Action [R-1]

Due to the change in practice as affecting final rejections, older decisions on questions of prematureness of final rejection or admission of subsequent amendments do not necessarily reflect present practice.

Under present practice, second or any subsequent actions on the merits shall be final, except where the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims nor based on information submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p).

Premature Final office Action

Not premature if not caused by amendment of claims. 37 cfr 1.113; MPEP 706.07.

MPEP 706.07(d)

The claim changes have been discussed above with this issue in mind. As explained, the changes did not change the claims, but repeated what was already claimed. The only changes I would ask for have been discussed above: the wire size range

The amendments to claims 1, 4, 7, 13, 19, 22 and 25 did not change the description of an accessory arch bar. The discussion of a "separate fixed appliance" was not necessitated by the amendments. Claims 3, 5 and 31 were not amended: therefore, did not necessitate the discussion. Claim 3 is composition of the arch bar, Claim 5 is the preferred size of the wire is the method of using the arch bar. The examiner introduced new grounds of rejection involving claims 3, 5 and 31 that were not necessitated by applicant's amendment. The present action should not have been final.

MPEP 706.07(f) states further argument will be considered under certain instances. I believe, in the present response, the following amendments are warranted.

Claim 1, line 8. ".....~~020~~ in. to .60 in. to .025 in. to .060 in.

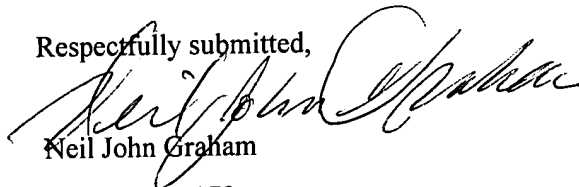
Claim 7, line 8. ".....~~020~~ in. to .60 in. to .025 in. to .060 in.

Claim 13. line 4 after diameter add .025 in. to .060 in.

Claim 19, line 9. ".....~~020~~ in. to .60 in. to .025 in. to .060 in.

Claim 25, line 9. ".....~~020~~ in. to .60 in. to .025 in. to .060 in.

Respectfully submitted,



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